

ART and SCALE

From: Based on original ideas by Patrick Rea and Orvil Schlatter
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Purpose: Student generated art will be utilized in order to teach students about scale.

National Geography Standards:

1. How to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective. (Horizontal and vertical lines correlate to latitude and longitude; grids and points of intersection correlate to map and globe use.)
2. How to use mental maps to organize information about people, places and environments in a spatial context. (By organizing the art-work based on grids, students learn to visualize spatially.)

Indiana Social Studies Academic Standards:

First and Second Grade – 1.3.3 and 2.3.2 (relative location of one grid to another).

Fourth Grade – 4.3.1 and 4.3.2 (utilizing the grid as latitude and longitude).

Seventh Grade – 7.3.3 (highlight the specific terms mentioned in the standard).

High School World Geography – 1.1 and 1.4.

Indiana Visual Art Academic Standards:

First Grade - 1.7.2, 1.7.3, 1.8.1, 1.10.1, 1.12.1, and 1.13.2.

Second Grade - 2.7.2, 2.7.3, 2.8.1, 2.10.1, 2.12.1, 2.13.1, and 2.13.2.

Third Grade – 3.7.2, 3.7.3, 3.8.1, 3.8.2, 3.13.1, and 3.13.2.

Fourth Grade – 4.7.2, 4.7.3, 4.8.1, 4.8.2, 4.10.1, 4.10.3, and 4.13.2.

Fifth Grade – 5.7.1, 5.7.2, 5.7.3, 5.8.1, 5.8.2, 5.10.1, 5.10.3, and 5.12.3.

Sixth Grade – 6.7.1, 6.7.2, 6.7.3, 6.8.1, 6.8.2, 6.10.1, 6.10.3, and 6.12.3.

Seventh Grade – 7.7.1, 7.7.2, 7.7.3, 7.8.1, 7.8.2, 7.10.1, 7.10.3, 7.12.3, and 7.13.1.

Eighth Grade – 8.7.1, 8.7.2, 8.7.3, 8.8.1, 8.8.2, 8.10.1, 8.10.2, 8.10.3, 8.12.1, 8.12.3, and 8.13.1.

High School – Standards 7, 8, 9, 10, 11.2, 12.1, and 13.1.

Indiana Math Academic Standards: (A conscious linkage incorporating the grade-level appropriate terminology must be made by the educator(s). Additional math standards could be incorporated depending upon the image chosen: more geometric shapes allow for further exploration into negative numbers, quadrants, opposite angles, and shapes.)

Third Grade – 3.5.1, 3.5.2, 3.5.4, 3.6.1,

Fourth Grade - 4.3.8, 4.5.1, and 4.7.4.

Fifth Grade - 5.1.4, 5.1.5, 5.1.7, 5.3.4, and 5.3.6.

Sixth Grade - 6.1.3, 6.2.6, 6.2.7, and 6.5.1.

Seventh Grade – 7.1.2, 7.4.1, 7.5.1, and 7.5.3.

Eighth Grade – 8.5.1, and 8.5.3.

High School – grids, graphs, linear plots, scale, proportions, and volume.

Objectives: Upon completion of this lesson/activity, students will be able to...

1. create a 1" by 1" grid, (and larger grids)
2. label the horizontal (bottom) and vertical (side) axis (lines) of the grid,
3. identify points of intersection between horizontal and vertical lines,
4. correlate grid squares from one image to a larger/smaller, corresponding grid,
5. duplicate an image based on corresponding grid lines, and
6. depict a fairly accurate representation of the original art-work/image within a new scale.

Materials Required:

- Student generated art on 8.5" x 11" paper (geometric patterns work best to start)
- Rulers/yard sticks

- 8.5" x 11" white paper and large sheets of white butcher paper
- Access to on-line resources

Key Vocabulary: (Webster's Dictionary)

Horizontal – Parallel to the horizon.

Vertical – Perpendicular to the horizon.

Axis – The imaginary line around which a solid body rotates.

Grid – a frame of straight lines.

Scale – Ratio of dimensions as shown on maps, etc., to actual distance or length.

Intersection – To cross one another.

Procedures: (The Teacher may want to demonstrate the following steps utilizing a simple example of art – squares, circles, triangles, rectangles,...)

1. Discuss with the students the concept of scale; display examples of various items demonstrating variations in scale. (Floor tiles, rulers, stitches on clothing, letter print size in books, student height, lines on writing paper,...)
2. Utilizing one of the students 8.5"x11" (simple) art-work, have the students create a 1" grid onto their art. Relate the grid to the previous discussion of scale. Label the horizontal portion of the grid (along either the 8.5" or the 11" side) at each one-inch mark by numbers (1-8/11), AND label the vertical portion of the grid by letters (a-h/k). Relate the concept of scale to a one-inch square on the students' art: what is inside of the one-inch square? How does the image in the one-inch square relate to the squares around it? The grid divides the art into a series of pieces of equal sizes. The pieces fit together like a puzzle with only one correct place for each piece, fitting next to the neighboring pieces. Talk about the words horizontal, vertical, axis, and grid.
3. Next, on a piece of plain white, 8.5"x11" paper, that already has grids in one-inch squares, have the students begin to transfer their existing art-work onto the plain paper beginning in corresponding squares (for example, square 1a, which would be the first square on the lower left-hand corner). Attempting to copy the art-work, but not focusing on perfection, is the goal. Understanding the idea of transferring an image based on fixed grid lines is another goal.
4. Once the students seem to understand the concept of copying the art-work, based on the grid lines, it is time to move forward. Utilizing the same original art-work, transfer the image to a larger piece of paper, which enables the art to appear bigger. Give the students each a 2'x2' piece of white paper. Have the students create grids on the paper that are 2"x2". Again, label the bottom (horizontal) lines from 1-8/11 and the side (vertical) lines from a-h/k.
5. Finally, have the students duplicate the art-work onto a 5"x5" grid.
6. Discuss the changes that the students observed in the image as it "grew" from 1", to 2" to 5". How did the scale change? How did changing scale effect the image? Image drawing your art-work onto a 12", or one foot" grid!!!

Assessment/Evaluation

1. Completion of the 1", 2", and 5" art-work.
2. Review of key vocabulary terms demonstrating comprehension.

Adaptations/Extensions

1. Relate the completed grids to the four cardinal directions and/or the four intermediary directions.
2. Younger students re-write the directions for the project.
3. Older students write an essay about the relationship between the geometric grid and the artistic work.
4. Utilize remote sensing images of the Earth as art-work (visit the following web site <http://www.earthasart.com> or review the **"Earth As Art"** lesson plan included in *The Huck Finn Project* web site).
5. Older students, incorporate concepts of volume, percentages, geometric shapes, algebraic equations.